AGRICULTURAL
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Bees and Wasps

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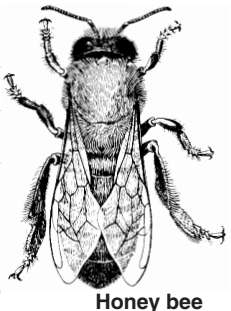
Bee and wasp stings cause several human deaths in the United States each year. The ability to sting, coupled with great mobility, make bees and wasps some of the most feared of all insects. Many species of bees and wasps are present in every geographic region of Missouri. Only a few of these species really need to be feared, however, and then only in special cases. Knowledge of their habits is the first step in reducing fear to a level of healthy respect.

Stinging insects such as ants, bees and wasps belong to the order Hymenoptera. Some hymenopterous insects such as sawflies and horntails do not possess stingers. In groups that do sting, only the females have stingers. Wasps sting repeatedly, but bees sting only once because bees have a barbed stinger that remains in the victim's skin. When the bee moves or is brushed away, the stinger is pulled from the bee's body along with the venom sac, which continues to pump venom into the victim. The bee dies after this one sting.

Most bees and wasps are social insects living in colonies, where tasks are divided among three castes: queens, males and workers. Queens are responsible for nest establishment and egg-laying. In most species, only one queen is present during most of the season. Workers are all females equipped with stingers. They constitute the vast majority of the colony's individuals. Males are usually small in number and appear for only a short time during the annual cycle.

Honey bees

Honey bees *(Apis mellifera)* are about 0.5 inch long with a fuzzy light brown to black appearance, with striped brown and black abdomens. They are considered to be the most beneficial species of insect because they pollinate plants and produce honey and bee's wax. However, because they sting in defense of their nest, honey bees may become a pest if nests are in the wrong location.


Honey bee

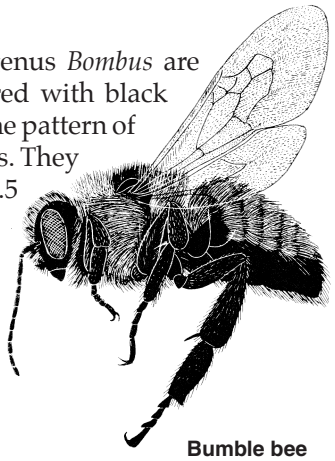
Wild colonies of honey bees nest in existing cavities such as hollow trees. Domestic bees are housed in manufactured hives. A honey bee colony occupies the same nest from year to year. A queen and many workers survive the winter inside the nest. At various times during the year, new queens are produced and the old queen and a number of workers leave the hive to "swarm." Swarming is the process of searching for a new home. If the swarm settles in a place where bees are not welcome, such as the wall of a house, then they become pests. There is a lower risk of being stung around a swarm because it is a period of vulnerability and the colony has no hive or honey to protect.

Ideally, honey bee swarms should be picked up before they start to establish a nest in an undesirable location. Some beekeepers will capture and remove swarms. If you need to contact beekeepers, police departments and Extension offices can direct you to them. Once a swarm establishes a nest inside a wall, it requires killing the bees. Some professional pest control operators provide this service for a fee.

If you choose to do this yourself, about 4 ounces of Deltadust® (deltamethrin) injected into the nest can kill the colony. Wear protective clothing. A second treatment should be made as a precaution within 7 days after the first. After all activity in the nest has ceased, open the wall and remove the dead bees, honey and wax. If left behind, wax can melt, allowing the honey and wax to run. This would damage the finished side of the wall. Nests above ceilings are an even greater problem in this regard. Remains of the nest can also attract other household pests such as dermestid beetles and mice.

Bumble bees

Bumble bees of the genus *Bombus* are robust and densely covered with black and yellow hairs (setae), the pattern of colors varying with species. They range in size from about 0.5 to 1.0 inch long. Bumble bees are social and nest in existing cavities, usually on or in the ground. They often use abandoned mouse nests, bird nests or anything containing cotton or other soft materi-


Bumble bee

als. Only fertilized queens survive the winter.

Bumble bees seldom enter structures and do not behave very aggressively except in defense of their nest. Normally they are a nuisance only if they have built a nest close to human activity. If control is necessary, it should be done by spraying or injecting a dust insecticide into the nest. Deltadust® (deltamethrin) or various other liquid/aerosol pyrethroids are effective (Table 1). This should be done after dark, using a flashlight with a red lens or a lens covered with red cellophane. Bees and wasps cannot see red. Therefore, they will not be attracted to the light, although the operator can still see well enough to apply the pesticide.

Table 1. Compounds available for treating bees and wasps.

Chemical compound	Sample product names	Chemical class
allethrin bifenthrin cyfluthrin cypermethrin deltamethrin esfenvalerate lambda-cyhalothrin permethrin sumithrin tetramethrin tralomethrin	Advance Garden Black Flag Bug B Gone D-Force DeltaDust Hornet & Wasp Killer Hot Shot Ortho Raid Wasp Freeze	pyrethroid
phenethyl propionate pyrethrum	EcoPCO Microcare	botanical

Warning: Apply chemicals only where needed. Make yourself aware of potential side effects to pesticide exposure. Before using any pesticide, please read the label carefully for directions on application procedures, appropriate rate, first aid, storage and disposal. Make sure that the chemical is properly registered for use on the intended pest and follow all other label directions. Keep insecticides in original containers, complete with labels, and keep them out of the reach of children and pets. Do not allow children or pets near treated areas before these areas dry. Carefully and properly dispose of unused portions of diluted sprays and empty insecticide containers.

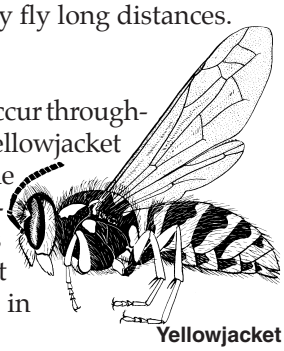
Solitary bees

Sweat bees, mining bees, leaf-cutting bees, and others make up a rather large group of small-bodied solitary bees (up to 0.5 inch long) common in most areas of Missouri. Most of these bees nest in the soil and often a large number of them will nest close together, usually in areas with sparse vegetation. Occasionally, some may nest in natural cavities in wood.

Sweat bees get their name from an attraction to people who are perspiring. They rarely sting except when pinned against the skin. Some species of mining bees may be attracted in large numbers to swimming pools.

All of these bees are beneficial because they pollinate plants. Controlling them is not desirable, even if it were easy to do so. When large numbers invade swimming pools, control may be needed and you can then treat the soil nests with any of the insecticides listed in Table 1. However, it is usually difficult to find the nesting site because these bees may fly long distances.

Yellowjackets



Yellowjacket

Two yellowjacket species occur throughout Missouri: the eastern yellowjacket *(Vespula maculifrons)* and the southern yellowjacket *(Vespula squamosa)*. A third species called the German yellowjacket *(Vespula germanica)* is common in the St. Louis area.

Yellowjackets are named after their yellow-and-black-striped body markings. Worker yellowjackets are about 0.5 inch long. Their nests consist of multilayered combs surrounded by a paper shell. The eastern yellowjacket and the southern yellowjacket usually build their nests in underground holes and only occasionally in aboveground cavities. The German yellowjacket almost always nests in aboveground cavities. A large nest usually is about the size of a basketball. In late summer, nests may contain up to 5,000 workers.

In late summer, colonies produce a group of new queens and males. After mating, these new queens go into hibernation and those surviving start new colonies the following spring. The rest of the colony does not survive the winter. Old nests are not reused.

All yellowjackets will aggressively defend their nests, but this aggressiveness increases in late summer and fall. Because yellowjackets forage for meats, sweets, ripe fruit and garbage, they pose a threat to humans even when they are not near their nests. They are usually a problem in picnic areas and orchards and around garbage containers.

Control of yellowjackets

Individual yellowjacket foragers are a difficult problem. A single wasp in an automobile can be gently pushed out an open window using an object such as a folded newspaper. A single yellowjacket on the lip of a soft drink container also should be gently coaxed away. Never swat a wasp, particularly while it is on your skin — that may prompt a sting. Good sanitation practices in picnic areas are essential. All food garbage and empty beverage cans should be placed in containers with tight-fitting lids.

If you have a problem with a large number of foraging yellowjackets, traps offer some control. One such trap is a dead fish suspended from a tripod above a water-filled tub with a wetting agent such as soap (see Figure 1). Foragers will come to the fish because of odor, and often they will cut away a piece that is too heavy to carry. As a result, they often fall into the water and are unable to get out because the wetting agent prevents them from floating.

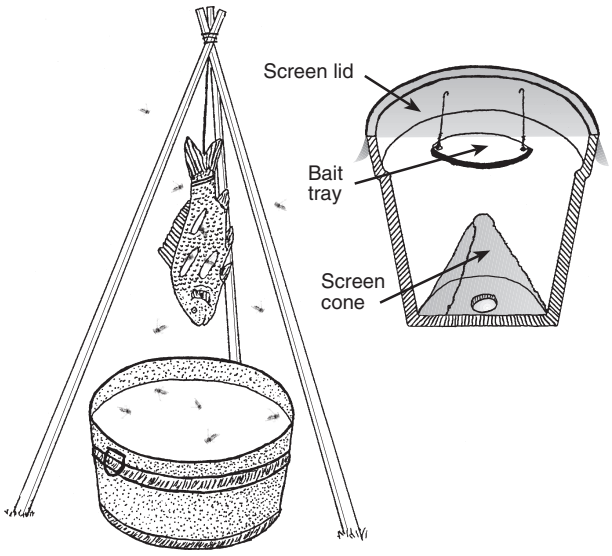


Figure 1. Traps for yellowjackets: a fish suspended over a water tub (left) and a screen-covered flowerpot.

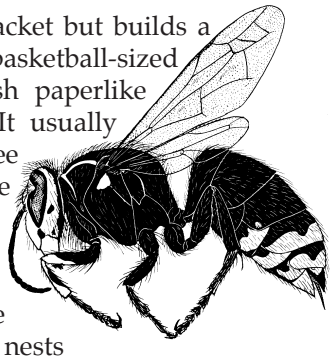
A second type of trap consists of a plastic or clay flower pot about 6 to 8 inches high with holes in the bottom (see Figure 1). A screen wire cone with a hole about 0.5 inch in diameter at the tip is inverted in the pot over the holes in the bottom. A bait tray is suspended from a tight-fitting screen covering the top of the pot. A piece of meat is placed on the tray to attract yellowjacket foragers. They enter through the holes in the bottom of the pot and then through the hole in the screen to get to the meat. Most will be unable to find their way back out. The trap should be tied to a post or suspended from a tree branch about 4 feet above the ground, so that the top and bottom of the pot are unobstructed. To kill the wasps in the trap, remove the trap and place it in a freezer overnight or spray the wasps with one of the compounds in Table 1.

Yellowjackets in underground nests can be killed by pouring about a quart of liquid insecticide into the entrance hole or by placing about one-half cup of an insecticide dust into the hole. Several effective insecticides labeled for wasp control are available over the counter to the homeowner. Typically these are pyrethroid compounds (Table 1).

Locate the nest during daylight and treat it after dark when all of the insects are in the nest. There may be more than one entrance to underground nests. If the ground is relatively smooth and soft around the entrance, placing a metal or hard plastic container upside down over the entrance hole after treating will help ensure control. Place a weight on the container to hold it snugly against the ground. Use a red lens flashlight during the treatment as described above for bumble bees. Various other traps are commercially available that offer varying degrees of success.

Hornets

The baldfaced hornet, *Dolichovespula maculata*, is about 0.7 inch long and is black with whitish markings. It is technically a yellowjacket but builds a distinctive pear-shaped, basketball-sized nest covered with grayish paperlike material (see Figure 2). It usually constructs its nest in a tree or shrub or under the eave of a building.

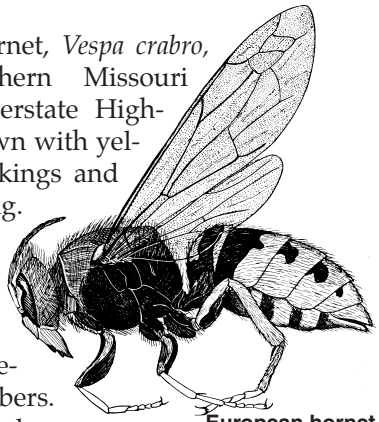


Baldfaced hornet

Baldfaced hornets are beneficial because they capture other insects. Since they tend to build their nests rather high up in trees and usually do not threaten humans, it is best to leave them alone. If it is necessary to destroy a nest, spray after dark with a pressurized spray stream directed into the nest opening, which is usually near the bottom. Scout the nest during daylight to locate the opening and use a red lens flashlight when treating at night. Use any of several commercial "bee and wasp sprays" or a product with a similar name. It is preferable to use a formulation that tends to "freeze" the insects on contact (see Table 1). Never use wasp freeze indoors.

Some people have tried to remove these nests by suddenly covering them with a plastic trash bag, tying it tightly to the branch, and then sawing the branch off. Don't do it! Baldfaced hornets can escape from trash bags with ease.

The European hornet, *Vespa crabro,* occurs across southern Missouri roughly south of Interstate Highway 44. It is dark brown with yellow and reddish markings and is about 1.2 inches long. It usually nests in a hollow tree or log, or within buildings. The nest is covered with a brown envelope of coarse wood fibers. Although it causes alarm because it is a large wasp and comes to lights at night, this wasp is actually not very aggressive.



European hornet

The European hornet preys on other insects and should be left alone unless the nest is located near human activity. If control is necessary, follow the same guidelines as for the baldfaced hornet.

Paper wasps

Several species of paper wasps of the genus *Polistes* occur in Missouri. All are about 0.7 to 1.0 inch long, slender and variously colored with brown, red and yellow. They build their single-comb unprotected nest from the eaves or porches of buildings or other sheltered locations (see Figure 2). As with all the other wasps, only the female queen survives the winter to start new colonies in the spring.

Paper wasps are not as aggressive as yellow-

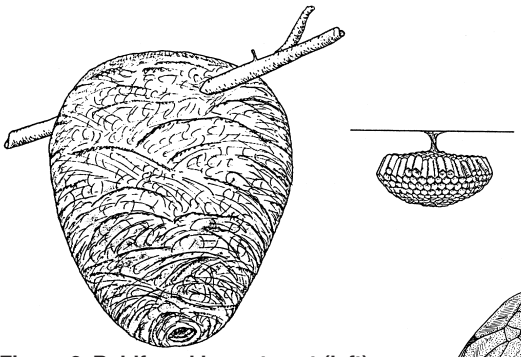
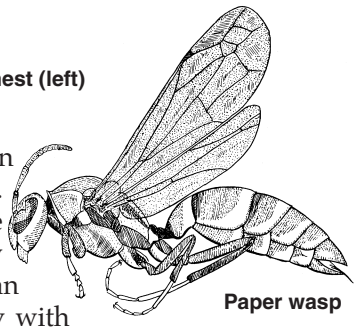


Figure 2. Baldfaced hornet nest (left) and paper wasp nest.

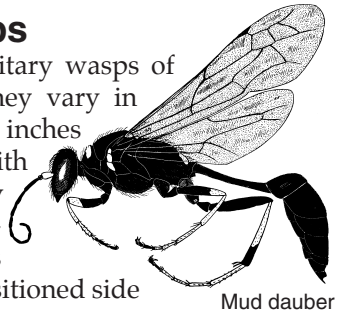
jackets or hornets in defense of their nest. These nests should be eliminated only if they are located near human activity. To do so, spray with a pressurized spray stream as described above for the baldfaced hornet. Return a few hours later and remove the nest to discourage others from nesting there.



Paper wasp

Mud dauber wasps

Mud daubers are solitary wasps of the family Sphecidae. They vary in length from 0.5 to 1.25 inches and are very slender with threadlike waists. They build mud nests in sheltered areas. These nests are tubelike cells often positioned side by side (see Figure 3).



Mud dauber

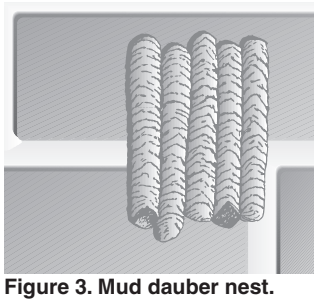


Figure 3. Mud dauber nest.

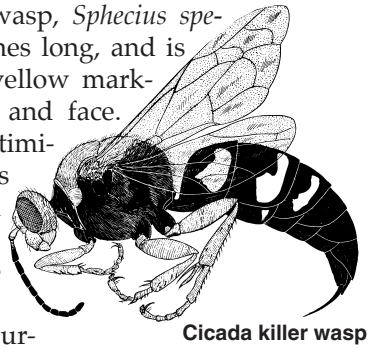
The female wasp stocks the nest with insects or spiders that she has captured and stung into paralysis. After laying an egg on the prey, that cell is closed and she starts on the next cell.

Mud daubers overwinter as larvae in the mud nests. One of Missouri's most common species is the black and yellow *Sceliphron caementarium*. A related common species, *Chalybion californicum,* is metallic blue with bluish wings. It steals the nests of *S. caementarium,* replacing nest contents with its own spiders and eggs.

Mud daubers usually sting only when pinned against the skin. They are beneficial except for their unsightly mud nests, which often are placed around human habitation. Undesirable nests should be knocked down and the residual soil washed off with water and a brush. No insecticide treatments are necessary.

Cicada killer wasps

The cicada killer wasp, *Sphecius speciosus,* is 1.5 to 2.0 inches long, and is brownish black with yellow markings on the abdomen and face. While their size is intimidating, cicada killers are not aggressive and will sting humans only if pinned against the skin.



Cicada killer wasp

The female digs a burrow in the soil. It captures cicadas, paralyzing them by stinging, and places them in the burrow. An egg is deposited on each cicada and that cell is closed off. Cicada killer wasps produce one generation per year, and the larvae spend the winter in the nest cell in the soil.

The only damage these wasps cause is the unsightly dirt piles dug out to create nests. The piles usually disappear with the first rain. Killing individual wasps is virtually impossible unless you spray them in the act of digging or soak the soil to kill developing larvae. Since cicada killers are so beneficial, control efforts are not recommended. If you feel control is necessary, spray the soil where digging activity is observed with a liquid insecticide labeled for wasp control.

Bee and wasp stings

A bee or wasp sting results in local pain, swelling, redness and itching for most persons. To minimize the sting, a poultice of meat tenderizer or salt can be applied to the site as soon as possible after the incident and left on for about 30 minutes. Use about 0.5 teaspoon mixed with enough water to produce a paste. Commercial swabs are available that do about the same thing.

Some people may react violently if they are stung. Symptoms can include difficulty in breathing, dizziness and nausea, as well as the more common symptoms listed above. With severe reactions, medical attention is needed. Anyone with a history of hypersensitive reactions should have a sting emergency kit available and should wear a medical alert bracelet or other alert item. Consult your physician about desensitization treatments.

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